EPA Question #4: Geotechnical Related Activities

Timing of Geotechnical Surveys

Introduction

Shell Exploration & Production Company – Alaska Venture (Shell) provides the following discussion on currently estimated timing, and methodology for conducting geotechnical surveys in the Alaska Arctic from vessels in the offshore and nearshore, and from vehicles working from landfast ice in the vicinity of the beach or shoreline crossing (transition zone). Shell assumes the offshore geotechnical surveys will be conducted in federal waters of the Outer Continental Shelf (OCS) and thus be governed by EPA's general permit for oil and gas geotechnical surveys (GGP) activities, which is currently in draft form. Whereas, geotechnical surveys conducted within three nautical miles of the coast, which may include some of the nearshore surveys and for the most part those in the transition zone, are within waters of the State of Alaska and therefore under the general permit for geotechnical surveys released by the Alaska Department of Environmental Conservation (DEC), which is also currently in draft form. Shell includes discussions of timing geotechnical surveys in the offshore, nearshore, and transition zone in this response to EPA because the timing of all three locations assume that their timing is dependent on Shell's communication regarding, and planned avoidance of, impacts to subsistence activities. While what is provided herein is believed to be a good representation of these activities, and their timing, at the current time, they may in the future be subject to some alteration owing to information/experiences obtained in the field and/or Shell's future developmental plans.

Offshore Geotechnical Surveys

Shell plans for a 110 day open-water Alaska Arctic offshore geotechnical campaign starting July 1 in Dutch Harbor. Our planning premise assumes approximately 62 working days out of the 110 day total and this assumes geotechnical surveys could be conducted in both the Beaufort and Chukchi Seas. Offshore geotechnical surveys will generally be carried out in federal waters of the Outer Continental Shelf (OCS) from the deck of a dedicated geotechnical vessel in waters approximately >25 meters (m) depth using conventional wet rotary techniques with drilling fluids discharged at the seafloor. Here the term drilling fluid(s) refers to the medium used while drilling with conventional wet rotary techniques. Depending on the depth of soil borings and subsurface conditions encountered during drilling of soil borings, the drilling fluid (s) may contain only seawater and excavated soil while drilling shallow borings (~< 50 feet), or could contain a drill mud/seawater mixture, and additives with cuttings (soil, sand, gravel, and rock bits) when drilling conditions call for additions to the drilling fluid(s).

Shell's planning assumes for the geotechnical survey vessel to be in the Chukchi Sea around July 4th. Shell assumes that during the next season offshore geotechnical surveys that the initial task to be conducted will be a sound source verification (SSV) in the Chukchi Sea. The SSV is a condition of the incidental harassment authorization (IHA) issued by the National Marine Fisheries Service (NMFS) and an SSV must be conducted before an authorized activity gets underway. Shell assumes we will have applied for an IHA for this activity, and in the first season the geotechnical vessel and equipment to be used to conduct underwater, geotechnical surveys will be subject to the SSV requirement, since the vessel and equipment would not likely have been subjected to a prior SSV in either the Beaufort or Chukchi Sea. If the offshore geotechnical survey vessel is planning for surveys in both the Beaufort and Chukchi Seas, then

following an SSV of 2 -3 days in the Chukchi Sea the vessel likel y would transit to the Beaufort Sea, if ice does not prohibit travel, and there will be an additional 2 or 3 days for an SSV in the Beaufort Sea. This planning assumes the ice normally trapped at Point Barrow has moved out. If the ice does not move out of the Beaufort Sea sufficiently to allow transit of the offshore geotechnical vessel , geotechnical survey activities w ould then commence after SSV in the Chukchi Sea until the vessel can safely transit past Point Barrow. The timing of the offshore geotechnical surveys in the Chukchi Sea precludes interference with the spring bowhead whale subsistence harvests out of Point Hope and Wainwright. Because of the limited number of available dedicated geotech nical survey vessels in the world , and the lack of those being ice classed, we believe other oil & gas (O&G) operators in the Arctic would formulate similar plans as Shell's for work in the Chukchi Sea.

If the geotechnical survey vessel transits past Point Barrow into the Beaufort Sea, geotechnical activities could commence in either Harrison Bay or Camden Bay after SSV , depending on Shell's planning. Shell's planning premise for t he Beaufort Sea assumes geotechnical surveys could continue until the vessel would likely depart the area in accordance with mitigation measures for bowhead whale subsistence harvests that Shell incorporates into our Plan of Cooperation (POC) with Beaufort Sea communities. Shell's planning premise is to not return to the Beaufort Sea for additional geotechnical surveys after departing. Depending on the volume of work to be conducted in the Beaufort, Shell's POC with the subsistence whaling communities may include measures to conduct work prior to freeze up. Shell's timing of geotechnical surveys via our POC will avoid conflict between Shel l's offshore geotechnical activities in the Beaufort Sea and fall bowhead whale subsistence h arvests. We expect similar plans to be formulated by other O&G operators in the Beaufort Sea.

Nearshore Geotechnical Surveys

Like the offshore geotechnical activities, nearshore geotechnical surveys for either the Chukchi or Beaufort Seas assumes the same 110 day season with a planning premise of at least 62 working days. Currently the nearshore work is planned to be performed from a self elevating, bottom founded barge (commonly termed lift barge) and will generally take place in state waters of Alaska, where DEC has primacy for discharges under their own geotechnical general permit. Depending on class of lift barge contracted , nearshore geotechnical surveys will be co nducted in waters <25m to a minimum water depth of about 5m. A lift barge offers a stable platform from which to perform the geotech nical surveys. The se surveys use conventional wet rotary techniques with drilling fluid d ischarges taking place at the seab ed, similar to the offshore portion of the project.

The timing of the nearshore work will correspond to that of the offshore portion of the work, during Shell's planning premise for a 110 day open -water season , after the spring bowhead whale subsistence h arvests of t he Chukchi Sea communities . In the Beaufort, portions of nearshore geotechnical surveys can be conducted from landfast ice within state waters in either Harrison or Camden Bay during the winter or early spring, a period outside of the bowhead whale subsistence harvests of the fall and within state waters under the primacy of the DEC geotechnical general permit. More seaward portions of nearshore geotechnical surveys in the Beaufort Sea can be conducted during the open water season and properly mitigated via Shell's POC with the subsistence whaling communities to avoid the potential for impact to bowhead whale subsistence harvests. Depending on the volume of work to be conducted in the Beaufort, Shell's POC with the subsistence whaling communiti es may include measures to conduct work prior to freeze up.

Beach or Shoreline Crossing (Transition Zone) Geotechnical Surveys

Shell's planning premise to perform transition zone geotechnical surveys begins in March when the landfast ice is at its thickest and anchored securely to the seabed, but depending on the year could begin as early as January. For all practical purposes, transition zone surveys are done within state waters and discharges from these surveys fall under the DEC geotechnical general permit. The timing of transition zone surveys is due to the fact that land drilling techniques and equipment, each mounted on a Rollingon, are brought out onto the landfast ice and used to perform the geotechnical activities through the ice. In 2006 Shell performed more than 40 soil borings across the transition zone to Flaxman and Mary Sachs Islands in Camden Bay using these methods. By using land geotechnical techniques from on ice, the boreholes are cased and drill returns taken at the surface. As in the above description of land drilling for the nearshore work, drill mud returns and cuttings are captured in a drilling pit at the surface and are recycled until they no longer shear or lift. At this point they are pumped off into a storage pit, vacuum truck, or barrels for later disposal at an onshore facility and a new batch of drill fluid and mud additives mixed. By using land techniques, there are no drilling fluids or cuttings intentionally discharged into the sea.

For future planning and taking into account the spring bowhead whale subsistence harvest in the Chukchi Sea, Shell may propose that transition zone geotechnical surveys begin from landfast ice as early as January. Shell would communicate this to the nearest communities and federal or state permitting agencies via Shell's POC. Potential for impacts to the spring bowhead whale subsistence harvest can be mitigated by conducting transition zone geotechnical surveys prior to the Chukchi Sea spring bowhead whale subsistence harvest. Due to the limited duration and limited distance landfast ice extends into the Chukchi Sea, operators may have a limited duration of time (perhaps as short as four weeks) to conduct on-ice geotechnical surveys in the transition zone of the Chukchi Sea out to about 10m of water depth, as this is normally as far out as the landfast ice extends in any given year. Since landfast ice is much more significant and extends much farther offshore in Camden and Harrison Bays, operators may plan to stay in the field performing geotechnical surveys for up to eight weeks or more in the Beaufort. Shell anticipates other operators, if performing similar work, would develop a similar schedule for on-ice geotechnical surveys.

Therefore, and as described in other submissions, Shell anticipates through development of a POC there could be no disruption to the spring bowhead whale subsistence harvest in the Chukchi Sea due to on-ice geotechnical activities in the shoreline transition zones. Hence, there is no justification for bowhead whale subsistence whaling closure periods through the EPA's draft geotechnical general permit for the Chukchi (and Beaufort) Seas. This is without regard to whether the surveys are limited to the transition zone, where DEC has primacy for discharges or even if transition zone surveys were extended into the federal waters of the OCS, where EPA's discharge authority governs. Further, the timing of offshore, nearshore, and transition zone geotechnical surveys proves the potential for impacts is effectively mitigated voluntarily by the planning and actions of the operators in their POC, rather than blanket closures to activities that essentially remove the incentive for practical cooperation.